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ABSTRACT

The United States Army, confronted with sophisticated defense machinery and entry level soldiers with low educational backgrounds, selected a systems approach to training that was developed in 1975 by Florida State University. Instructional Systems Development (ISD), a five-phase process encompassing the entire educational environment, is specifically oriented towards the use of behavioral/performance objectives and criterion-referenced tests. The phases of ISD are analysis, design, development, implementation, evaluation, and control. The instructional design phase consists of: (1) a description of the proposed student target population; (2) lists of skills and knowledge required to perform each of the critical tasks; (3) complete behavioral objectives; and (4) criterion-referenced test items. An instructional sequence is developed, using a review of existing lesson materials as background. Before the curriculum is implemented all instructors are taught how to function within an objective-oriented, criterion-referenced system. Because of continuous turnover of personnel in the Army, this training is an ongoing process. Instructor performance is monitored to make sure that lesson information is being taught and to evaluate teacher qualities and techniques. Student performance is measured both in class and on the job after graduation. The student, learning materials, and instructor data is collected, assessed, and channeled back into the system to revise and improve the effectiveness of the course. A flow chart demonstrating objectives and activities in all phases of the course is appended. (JD)

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Presented to the International Congress for Individualized Instruction

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INSTRUCTIONAL SYSTEMS DEVELOPMENT

For a number of years, the United States Army was confronted with the difficult question of how to develop and conduct training to insure that all of the skills and knowledges required to perform a particular job were identified and presented in the most effective manner. As defense machinery was becoming more and more sophisticated, the educational background of entry level soldiers was becoming lower and lower.

The potential solution to this problem was in the form of a "systems approach" to training. The system selected for use by the Army was Instructional Systems Development (ISD), developed in 1975 by Florida State University. ISD is a comprehensive five phase process encompassing the entire training/educational environment. Although ISD is a systematic step-by-step approach, it has the flexibility to be used with both individualized and traditional instruction. It is, however, specifically oriented towards the use of behavioral/performance objectives and criterion-referenced tests.

The five phases of ISD are analysis, design, development, implementation, and evaluation and control. The first four are sequential in nature, but the evaluation and control phase is a continuous process that is conducted in conjunction with all of the others. Employment of the system is initiated by one of many different types of triggering cues, ranging from performance discrepancies to new concepts that must be taught. As the analysis phase begins, a detailed research program is implemented to gather and refine all existing data on the subject/job. This information, written in performance terminology, is then submitted to a board of subject matter experts who will select those tasks that are critical to the performance of the job being analyzed.

The design phase begins with a detailed learning analysis of each of those tasks identified as critical. The results of these analyses are (1) a description

of the proposed student target population, (2) lists of all of the skills and knowledges required to perform each of the critical tasks, (3) complete behavioral objectives, and (4) criterion-referenced test items. Tests are constructed at this point in the process to insure that only the material specified in the objective is tested. The final step in the design phase involves selecting the appropriate instructional delivery methodology. If the material is to be presented in an individualized mode, an instructional sequence is developed offering the student as many alternative avenues to progress through the course as possible. If the course is to be traditional in nature, a linear sequence is designed.

Phase three concerns the actual writing of instruction. Before beginning, however, a thorough review of existing materials is conducted. This is done to preclude the re-invention of the wheel. Once all of the lesson materials have been developed, they must be validated. This is accomplished to verify that the instruction teaches the objectives, and that the tests test the objectives. Once this has been completed, the curriculum is ready to be implemented.

Teacher training is the first step in phase four. Before the curriculum can be implemented, all of the instructors must be taught how to function within an objective-oriented, criterion-referenced system. This becomes an ongoing process in the Army because of the continuous turnover of personnel. The primary purpose of phase four, however, is to conduct the actual instruction of the developed curriculum.

As the curriculum is being implemented, as well as, throughout the entire process, phase five actions are taking place. The material is evaluated as it is being written to insure that it is developed in accordance with the ISD model.

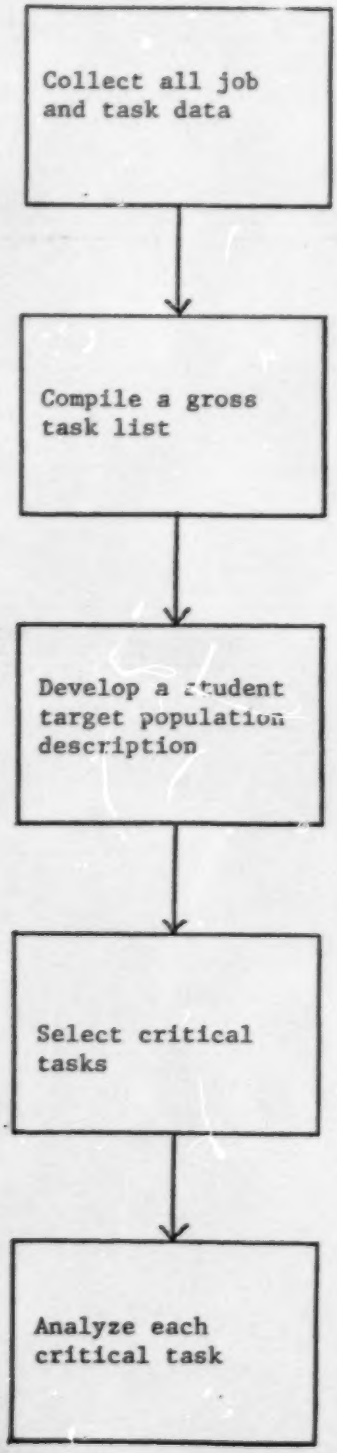
Instructor performance is monitered to make sure that lesson information is in fact being taught, and to evaluate teacher qualities and techniques. Student performance is measured both in class and on the job after graduation. The student, material, and instructor data collected are assessed and channeled back in to the system to revise and improve the effectiveness of the course.

Thus, the Instructional Systems Development model is a circular process designed to meet all of the requirements of a complete training environment.

INSTRUCTIONAL SYSTEMS DEVELOPMENT

(How it works)

PHASE I ---- ANALYSIS


Collect all job and task data
Compile a gross task list
Develop a student target population description
Select critical tasks
Analyze each critical task

Interviews, surveys, task observations, and document research are conducted to gather all existing information on the subject or job.

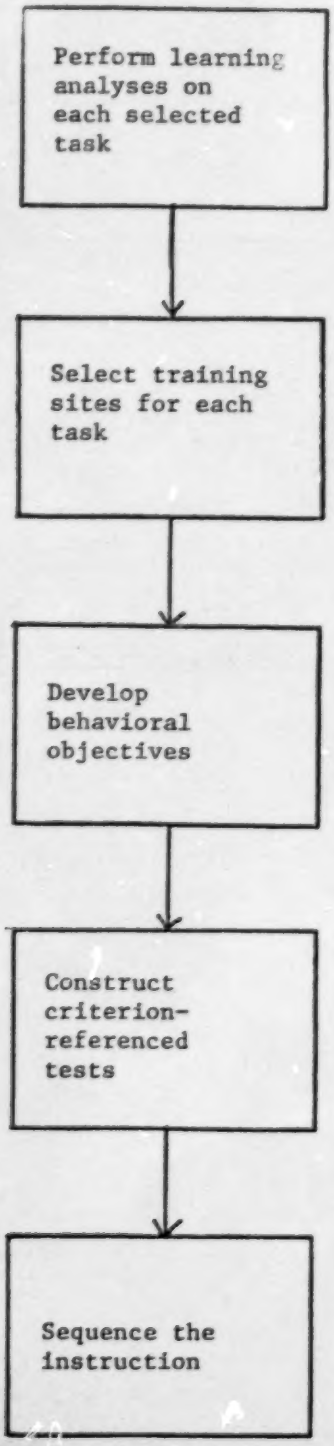
All of the information is written in performance terminology and converted into a massive task list.

A comprehensive description of the student target population is constructed. Data regarding educational backgrounds, physical characteristics, etc... is compiled.

Those tasks critical for the appropriate military skill level performance are selected by a board of subject matter experts.

Each selected task is analyzed detailing every step and decision required for its successful accomplishment.

PHASE II ------- DESIGN


Perform learning analyses on each selected task
Select training sites for each task
Develop behavioral objectives
Construct criterion-referenced tests
Sequence the instruction

Each task is analyzed in a hierarchy format to identify all required skills, knowledges, and learning relationships.

Training sites for each task are identified based on facilities, and equipment and instructor requirements.

Complete three-part behavioral objectives are developed for each major task/skill.

Criterion test items are next constructed for each of the developed objectives.

Either a linear or multiple course sequence is designed based on the instructional methodology to be used.

PHASE III ------ DEVELOPMENT

All existing literature on the subject is reviewed to see if it can be used. Any necessary revisions are made at this time.

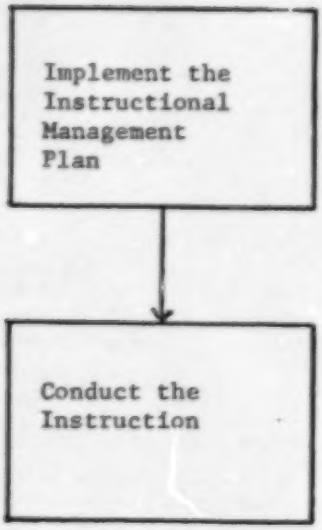
The previously identified skills and corresponding learning domains are processed through a matrix to determine the most effective methods and media.

All new course materials are developed at this time. This step is done in close coordination with the analyst and designer.

All material, both new and revised, is validated through individual, group, and field validations. Revisions are made and validated.

A plan is developed outlining how the curriculum is to be implemented. Any constraints the instructor should know about are detailed at this time.

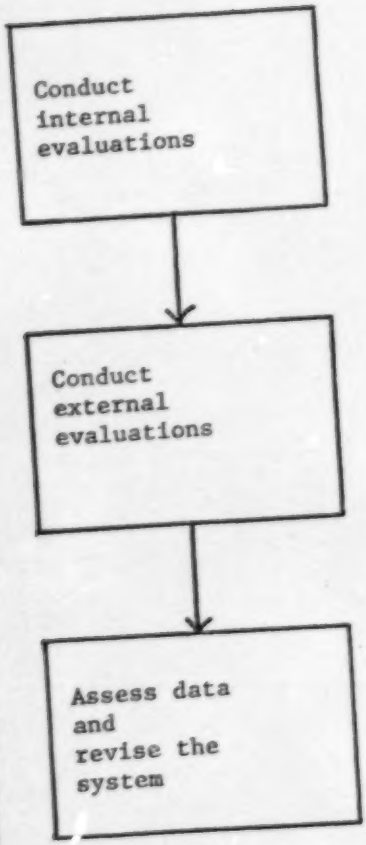
PHASE IV ------ IMPLEMENTATION



Management and instructor personnel are selected and trained. Coordination is effected among all departments involved in the instructional and instructional support process.

The developed curriculum is taught in the classroom.

PHASE V ------- EVALUATION AND CONTROL



The curriculum, instructor performance, and student performance are evaluated to determine effectiveness and efficiency.

The performance of course graduates is evaluated on the job to help determine if the course teaches what the field requires.

All data is statistically analyzed and significant results are channeled back in to the system to revise and improve the course.

ISD WORK FLOW